

## 8.7 Noise

This section presents an assessment of potential noise effects related to the SVEP. Section 8.7.1 discusses the fundamentals of acoustics. Section 8.7.2 describes the affected environment, including baseline noise level survey methodology and results. Section 8.7.3 discusses the environmental consequences from construction and operation of the power plant and associated facilities. Section 8.7.4 discusses cumulative impacts. Section 8.7.5 discusses mitigation measures. Section 8.7.6 presents applicable laws, ordinances, regulations, and standards. Section 8.7.7 presents agency contacts, and Section 8.7.8 presents permit requirements and schedules. Section 8.7.9 contains references.

### 8.7.1 Fundamentals of Acoustics

Acoustics is the study of sound, and noise is defined as unwanted sound. Airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave. Acoustical terms used in this section are summarized in Table 8.7-1.

TABLE 8.7-1  
Definitions of Acoustical Terms

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the $L_{eq}$ level.
Background Noise Level	The underlying ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the $L_{90}$ percentile noise level.
Intrusive	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal content, the prevailing ambient noise level as well as the sensitivity of the receiver. The intrusive level is generally defined by the $L_{10}$ percentile noise level.
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Level (dBA)	The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Equivalent Noise Level ( $L_{eq}$ )	The average A-weighted noise level, on an equal energy basis, during the measurement period.
Percentile Noise Level ( $L_n$ )	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., $L_{90}$ )
Day-Night Noise Level ( $L_{dn}$ or DNL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels from 10:00 p.m. to 7:00 a.m.

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a fashion similar to how a person perceives or hears sound, thus achieving a good correlation with the evaluation of acceptable and unacceptable sound levels.

A-weighted sound levels are typically measured or presented as equivalent sound pressure level ( $L_{eq}$ ), which is defined as the average noise level, on an equal energy basis for a stated period of time, and is commonly used to measure steady state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by  $L_{xx}$ , where xx represents the percentile of time the sound level is exceeded. The  $L_{90}$  is a measurement that represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, the  $L_{10}$  represents the noise level exceeded for 10 percent of the measurement period.

Some metrics used in determining the impact of environmental noise consider the differences in response that people have to daytime and nighttime noise levels. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises. To account for human sensitivity to nighttime noise levels, the Day-Night Sound Level ( $L_{dn}$  or DNL) was developed.  $L_{dn}$  is a noise index that accounts for the greater annoyance of noise during the nighttime hours.

$L_{dn}$  values are calculated by averaging hourly  $L_{eq}$  sound levels for a 24-hour period, and apply a weighting factor to nighttime  $L_{eq}$  values. The weighting factor, which reflects the increased sensitivity to noise during nighttime hours, is added to each hourly  $L_{eq}$  sound level before the 24-hour  $L_{dn}$  is calculated. For the purposes of assessing noise, the 24-hour day is divided into two time periods, with the following weightings:

- Daytime: 7 a.m. to 10 p.m. (15 hours) Weighting factor of 0 dB
- Nighttime: 10 p.m. to 7 a.m. (9 hours) Weighting factor of 10 dB

The two time periods are then averaged to compute the overall  $L_{dn}$  value. For a continuous noise source, the  $L_{dn}$  value is easily computed by adding 6.4 dB to the overall 24-hour noise level ( $L_{eq}$ ). For example, if the expected continuous noise level from the power plant was 60.0 dBA, the resulting  $L_{dn}$  from the plant would be 66.4 dBA. The community noise equivalent level (CNEL) is similar to the  $L_{dn}$ , but adds a weighting factor 5 dBA during the evening hours of 7 p.m. to 10 p.m. In most cases, the  $L_{dn}$  and CNEL are considered equivalent.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and

habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" environment to which that person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

Table 8.7-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

**TABLE 8.7-2**  
Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
Shotgun (at shooter's ear)	140	Carrier flight deck	Painfully loud
Civil defense siren (100 ft)	130		
Jet takeoff (200 ft)	120		Threshold of pain
Loud rock music	110	Rock music concert	
Pile driver (50 ft)	100		Very loud
Ambulance siren (100 ft)	90	Boiler room	
Pneumatic drill (50 ft)	80	Noisy restaurant	
Busy traffic; hair dryer	70		Moderately loud
Normal conversation (5 ft)	60	Data processing center	
Light traffic (100 ft); rainfall	50	Private business office	
Bird calls (distant)	40	Average living room library	Quiet
Soft whisper (5 ft); rustling leaves	30	Quiet bedroom	
	20	Recording studio	
Normal breathing	10		Threshold of hearing

Source: Beranek, 1998.

## 8.7.2 Affected Environment

### 8.7.2.1 Local Land Use and Noise Sources

The land uses immediately surrounding the SVEP site are mostly agricultural, with a few industrial uses to the north, and residential uses under construction to the east and south. The project site is currently in agricultural use and there are agricultural uses to the south and west of the site. To the north is the Southern California Edison Valley Substation. Immediately to the east are agricultural fields that, like the SVEP site, have a land use designation of light industrial and are zoned Industrial Park under the Riverside County General Plan. Further east, on the eastern side of Menifee Road, is the Menifee Valley Ranch residential subdivision, which is under construction. Further north is an industrial area on the outskirts of the residential community of Romoland. The nearest residence to the project site is

located on an adjacent parcel to the east. The primary source of noise in the project area is vehicular traffic.

### 8.7.2.2 Ambient Noise Survey

SVEC conducted continuous ambient noise monitoring to determine the level of noise in the project area. There were two monitoring locations (Figure 8.7-1): (1) the center of the project site (location M1), monitored continually for over 25 hours; and (2) the newly constructed Boulder Ridge Elementary School (location M2), approximately 0.52 mile south of the site measured for 15 minutes during the middle of the night (01:53).

Monitoring equipment included a Larson Davis 820 for the continuous measurements at M1 and a Larson Davis 824 at M2. The sound level meters were field calibrated before and after the measurement with a Larson Davis CAL200. All equipment was ANSI Type 1 (precision) and was factory calibrated within the previous 12 months.

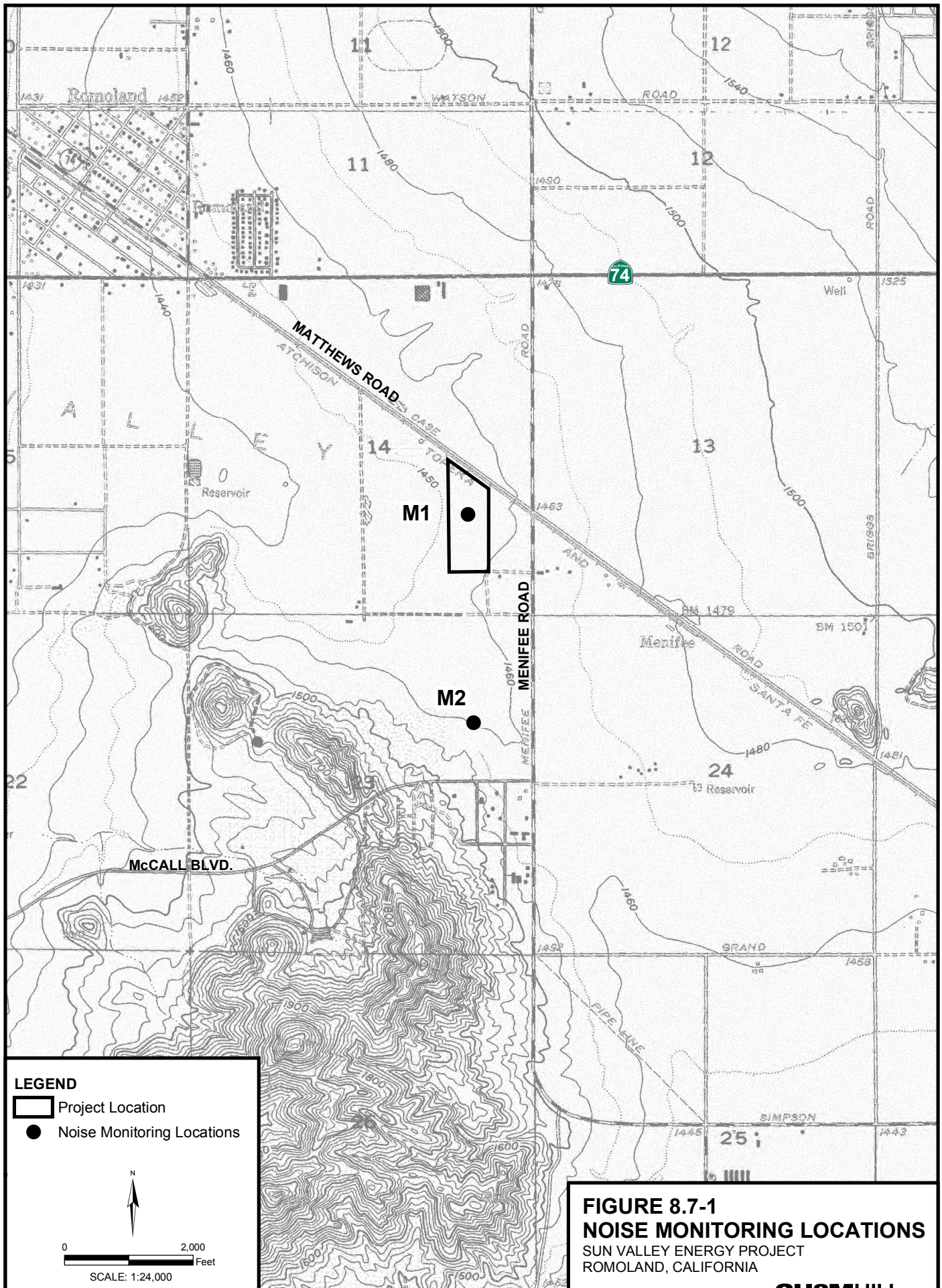
Clear skies and a light breeze during the day (generally less than 10 mph at the microphone) persisted throughout most of the measurement period. At the start of the measurement period, the temperature was approximately 65 °F and the humidity was 60 percent. At the end of the measurement period, the temperature was approximately 60°F and humidity was 60 percent.

Monitoring location M1 is in the center of a flat agricultural field, approximately 700 feet from the nearest roadway. The setting is rural, with agricultural fields in all directions. Because of the distance from Interstate 215, Highway 74, and the community of Romoland, nighttime ambient noise is relatively low at this location. Monitoring location M2 is located on the lower flanks of a hill, approximately 700 feet from Menifee Road and about the same distance north of McCall Boulevard. This area is currently rural, and surrounded mostly by agricultural uses, although residential and commercial developments are planned for construction in the near future in this area.

Tables 8.7-3 and 8.7-4 present the monitoring results. The average  $L_{90}$  at M1 between 10 p.m. and 7 a.m. was 38 dBA and the  $L_{dn}$  was 55 dBA. Because M1 was located in the middle of the project site and was farther away from the primary noise source, Menifee Road, than the closest existing and future receptors, these results are a conservative representation of the existing noise levels. In addition, there are several major developments in the immediate project vicinity that may significantly increase the ambient noise in the project area in the near future. These include the Menifee Valley Ranch planned development, which will be located east of Menifee Road and east of the project site. This development includes residential, commercial, and community uses. Menifee Road will be widened to become a four-lane arterial road to accommodate this new development, which will be buffered from Menifee Road (and the project site) by sound walls.

Several other, smaller residential and commercial developments are planned for the area to the south of the project site along McCall Boulevard. These include:

- McCall Canyon residential subdivision located on McCall Boulevard
- A shopping center on McCall Boulevard near Menifee Road
- Woodside residential subdivision located near Menifee Road and McCall Boulevard



Other developments that may increase the ambient noise levels in the project area in the near future include the Inland Empire Energy Center, which is now under construction to the northeast of the SVEP. In addition, the area surrounding the SVEP and between the SVEP and Menifee Road is zoned industrial and it is expected that industrial uses will fill in this area at some time in the future and may significantly block noise from the SVEP and buffer it from residential areas to the south and east.

TABLE 8.7-3  
Summary of Continuous Noise Measurements at the SVEP site (M1) (dBA)

Date & Time	L <sub>eq</sub>	L <sub>50</sub>	L <sub>90</sub>	Date & Time	L <sub>eq</sub>	L <sub>50</sub>	L <sub>90</sub>
9/7/05 19:25	51	47	42	9/8/05 8:00	46	44	42
9/7/05 20:00	47	46	42	9/8/05 9:00	45	43	40
9/7/05 21:00	49	46	41	9/8/05 10:00	43	42	40
9/7/05 22:00	45	44	38	9/8/05 11:00	49	42	39
9/7/05 23:00	42	39	35	9/8/05 12:00	50	41	38
9/8/05 0:00	40	37	32	9/8/05 13:00	47	39	36
9/8/05 1:00	40	37	33	9/8/05 14:00	52	48	43
9/8/05 2:00	40	37	32	9/8/05 15:00	49	46	43
9/8/05 3:00	43	40	37	9/8/05 16:00	50	46	43
9/8/05 4:00	45	43	38	9/8/05 17:00	49	46	42
9/8/05 5:00	50	49	42	9/8/05 18:00	48	47	43
9/8/05 6:00	55	54	50	9/8/05 19:00	52	47	44
9/8/05 7:00	57	56	50	9/8/05 20:00	56	46	42

TABLE 8.7-4  
Summary of Attended Measurement at (M2) (dBA)

Date & Time	Duration	L <sub>eq</sub>	L <sub>50</sub>	L <sub>90</sub>
9/8/2005 1:53	15 minutes	36	33	29

### 8.7.3 Environmental Consequences

The proposed SVEP will produce noticeable noise but the noise levels will be in compliance the County of Riversides requirements for stationary sources. Noise will also be produced at the site during the construction phase of the project. Potential noise impacts from construction and operation activities are assessed in this section.

### 8.7.3.1 Significance Criteria

Following the California Environmental Quality Act (CEQA) guidelines (California Code of Regulations, Title 14, Appendix G, Section XI), the project would cause a significant impact if it would result in the following:

- Exposure of people to noise levels in excess of standards established in the local General Plan or noise ordinance
- Exposure of people to excessive ground-borne noise levels or vibration
- Substantial permanent increase in ambient noise levels in the project vicinity
- Substantial temporary or periodic increase in ambient noise levels in the project vicinity

Generally, the design basis for noise control is the minimum, or most stringent, noise level required by any of the applicable LORS. Therefore, noise from this project is evaluated against the County of Riverside's requirements. The County of Riverside does not have a noise ordinance, however the Noise Element of the General Plan establishes quantitative standards for "Land Use Compatibility for Community Noise Exposure" and preferred noise levels for stationary noise sources.

The California Energy Commission (CEC) Staff has stated that increases in background noise lower than 5 dBA at a sensitive receptor are clearly not adverse or significant and increases in background noise above 10 dBA at a sensitive receptor are clearly significant and adverse and that increases in background noise between 5 and 10 dBA may or may not be significant, depending on the circumstances (CEC, 2002).

The CEC Staff has also stated that construction noise is typically insignificant if: (1) the construction activity is temporary, (2) use of heavy equipment and noisy activities is limited to daytime hours, and (3) all feasible noise abatement measures are implemented for noise-producing equipment (CEC, 2002).

### 8.7.3.2 Construction Impacts

#### 8.7.3.2.1 Plant Construction Noise

Construction of the SVEP is expected to be typical of other power plants in terms of schedule, equipment used, and other types of activities. The noise level will vary during the construction period, depending upon the construction phase. Construction of power plants can generally be divided into five phases that use different types of construction equipment. The five phases are: (1) demolition, site preparation, and excavation; (2) concrete pouring; (3) steel erection; (4) mechanical; and (5) clean-up (Miller et al., 1978).

Both the USEPA Office of Noise Abatement and Control and the Empire State Electric Energy Research Company have extensively studied noise from individual pieces of construction equipment as well as from construction sites of power plants and other types of facilities (USEPA, 1971; Barnes et al., 1976). Since specific information on types, quantities, and operating schedules of construction equipment is not available at this point in project development, information from these documents for similarly sized industrial projects will be used. Use of this data, which is between 21 and 26 years old, is conservative since the evolution of construction equipment has been toward quieter designs to protect operators from exposure to high noise levels.

The loudest equipment types generally operating at a site during each phase of construction are presented in Table 8.7-5. The composite average or equivalent site noise level, representing noise from all equipment, is also presented in the table for each phase.

Average or equivalent construction noise levels projected at various distances from the site are presented in Table 8.7-6. These results are conservative since the only attenuating mechanism considered was divergence of the sound waves in open air. Shielding effects of intervening structures are not included in the calculations. The construction noise will be audible at the nearest dwelling units but the noisiest construction activities will be confined to the daytime hours. Table 8.7-7 presents noise levels from common construction equipment at various distances.

TABLE 8.7-5  
Construction Equipment and Composite Site Noise Levels

Construction Phase	Loudest Construction Equipment	Equipment Noise Level (dBA) at 50 feet	Composite Site Noise Level (dBA) at 50 feet
Demolition, site clearing, and excavation	dump truck	91	89
	backhoe	85	
Concrete pouring	truck	91	78
	concrete mixer	85	
Steel erection	derrick crane	88	87
	jackhammer	88	
Mechanical	derrick crane	88	87
	pneumatic tools	86	
Clean-up	rock drill	98	89
	truck	91	

Source: USEPA, 1971; Barnes et al., 1976.

TABLE 8.7-6  
Average Construction Noise Levels at Various Distances

Construction Phase	Sound Pressure Level (dBA)		
	375 feet	1,500 feet	3,000 feet
Demolition, site clearing, and excavation	71	59	53
Concrete pouring	60	48	42
Steel erection	69	57	51
Mechanical	69	57	51
Clean-up	71	59	53

**TABLE 8.7-7**  
Noise Levels from Common Construction Equipment at Various Distances

<b>Construction Equipment</b>	<b>Typical Sound Pressure Level at 50 feet (dBA)</b>	<b>Typical Sound Pressure Level at 375 feet (dBA)</b>	<b>Typical Sound Pressure Level at 1,500 feet (dBA)</b>
Dozer (250-700 hp)	88	70	58
Front End Loader (6-15 cu. yd.)	88	70	58
Trucks (200-400 hp)	86	68	56
Grader (13 to 16 ft. blade)	85	67	55
Shovels (2-5 cu. yd.)	84	66	54
Portable Generators (50-200 kW)	84	66	54
Derrick Crane (11-20 tons)	83	65	53
Mobile Crane (11-20 tons)	83	65	53
Concrete Pumps (30-150 cu. yd.)	81	63	51
Tractor (3/4 to 2 cu. yd.)	80	62	50
Unquieted Paving Breaker	80	62	50
Quieted Paving Breaker	73	55	43

Noise generated during the testing and commissioning phase of the project is not expected to be substantially different from that produced during normal full-load operation. Starts and abrupt stops are more frequent during this period, but on the whole they are usually short-lived.

#### 8.7.5.2.2 Construction Vibration

Pile driving would be the most significant potential source of construction vibration and will not be required for this project.

#### 8.7.3.2.3 Construction Worker Exposure to Noise

Worker exposure levels during construction of the SVEP will vary depending on the phase of the project and the proximity of the workers to the noise-generating activities. Construction noise is potentially harmful to the health and hearing of construction workers. The construction contractor will prepare and implement a Hearing Protection Plan that complies with Cal-OSHA requirements. This Hearing Protection Plan will be incorporated into the project construction Health and Safety Plan. The plan will require necessary hearing protection for workers and visitors throughout the duration of the construction period.

#### 8.7.3.3 Operational Impacts

##### 8.7.3.3.1 Worker Exposure

Nearly all components will be specified not to exceed near-field maximum noise levels of 90 dBA at 3 feet (or 85 dBA at 3 feet where available as a vendor standard). Since there are no permanent or semi-permanent workstations located near any piece of noisy plant equipment, no worker's time-weighted average exposure to noise should approach the level

allowable under OSHA guidelines. Nevertheless, signs requiring the use of hearing protection devices will be posted in all areas where noise levels commonly exceed 85 dBA, such as inside acoustical enclosures. Outdoor levels throughout the plant will typically range from 90 dBA near certain equipment to roughly 65 dBA in areas more distant from any major noise source.

#### 8.7.3.3.2 Transmission Line and Switchyard Noise Levels

One of the electrical effects of high-voltage transmission lines is corona. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. Corona is generally a principle concern with transmission lines of 345 kV and higher. Noise is also generally associated with foul weather conditions. Because the transmission line is 115 kV corona noise is not anticipated to be significant.

#### 8.7.3.3.3 Plant Operational Noise Levels

A noise model of the proposed SVEP facility has been developed using source input levels derived from manufacturers' data and field surveys of similar equipment. The noise emissions from the plant have been calculated at the residential receptors of potential concern. The most stringent requirement is the County's preferred noise limit for stationary sources at residential areas of 45 dBA at night and 65 dBA during the day (based on a 10-minute  $L_{eq}$ ). In addition, the County General Plan's guideline for single-family residential developments stipulates that noise levels in residential areas up to 60 dBA  $L_{dn}$  (54 dBA  $L_{eq}$ ) are "normally acceptable" and levels up to 70 dBA  $L_{dn}$  (64 dBA  $L_{eq}$ ) are "conditionally acceptable" or acceptable after detailed noise analysis and incorporation of noise insulation features.

The residential receptors nearest the project include a residence on an adjacent parcel to the southeast within 300 feet of the project boundary and a residence 1,100 feet to the west. These residences, however, are non-conforming uses in areas zoned industrial. If these remain residential uses at the time of project construction, it may be feasible to agree to noise mitigation measures at the residential sites to meet interior noise standards. An additional rural residence is located 1,500 feet to the southwest.

There will also be residential receptors in the Menifee Valley Ranch specific plan development. Although there are currently no occupied residences at this development, the specific plan area has been permitted and is under construction. The Menifee Valley Ranch is located on the east side of Menifee Road approximately 1,000 feet east of the SVEP project boundary. The noise levels modeled represent the anticipated steady-state level from the plant with essentially all equipment operating at the residences within the Menifee Valley Ranch.

Standard acoustical engineering methods were used in the noise analysis. The noise model, CADNA/A by DataKustik GmbH of Munich, Germany, is sophisticated and enables one to fully model complex industrial plants. The sound propagation factors used in the model have been adopted from ISO 9613-2 *Acoustics – Sound Attenuation During Propagation Outdoors* and VDI 2714 *Outdoor Sound Propagation*. The model divides the proposed facility into a list of individual point and area noise sources representing each piece of equipment that produces a significant amount of noise. The sound power levels representing the

standard performance of each of these components are assigned based either on field measurements of similar equipment made at other existing plants, data supplied by manufacturers, or information found in the technical literature. Using these standard power levels as a basis, the model calculates the sound pressure level that would occur at each receptor from each source after losses from distance, air absorption, blockages, etc. are considered. The sum of all these individual levels is the total plant level at the modeling point.

The sound power levels used in the model are summarized in Table 8.7-8, by octave band. Because the GE Energy LMS100 turbine is new, this data is considered preliminary.

**TABLE 8.7-8**  
Octave Band Sound Power Levels Used to Model SVEP Operations, Db (Flat)

Plant Component	Octave Band Center Frequency, Hz									dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Stacks	115	112	108	104	98	93	95	96	96	104
LMS100 Combustion Turbine Generators (CTG)	123	121	118	109	103	100	99	105	99	110
Cooling Tower	114	115	115	111	108	106	102	103	101	112
Fuel Gas Compressors	115	116	112	109	110	111	109	109	108	105
Gas Cooler	107	111	107	98	99	93	99	103	101	107
Transformers	108	111	105	105	100	94	91	88	88	102
SCR Duct Walls	117	116	118	111	104	99	94	84	72	108

The modeling shows that noise attributable to the project at the western boundary of the Menifee Valley Ranch subdivision, 1,000 feet east of the project site, will be approximately 54 dBA. This complies with the daytime preferred standard of 65 dBA for stationary sources, and the County's Land Use Compatibility guideline of 60 dBA  $L_{dn}$  (54  $L_{eq}$ ) for single-family residential areas. It is below the exterior noise standard for residential development of 65 dBA CNEL (59  $L_{eq}$ ) that the subdivision is required to meet per the Menifee Valley Ranch Specific Plan EIR (Riverside County, 2002). The Menifee Valley Ranch project will meet this standard primarily by blocking traffic noises (71 to 78 dBA CNEL) adjacent to arterial roadways near this development. The subdivision will use several measures to meet this standard, including the construction of eight-foot-high sound walls adjacent to Menifee Road.

Although the project would increase the nighttime ambient noise levels, the existing nighttime levels are likely not representative of the ambient noise levels that will be present in the year 2008, when the project will be in operation, because of rapid project area development. The Menifee Valley Ranch subdivision has recently begun construction of more than 4,000 residential units. As part of this development, Menifee Road is being widened to a four-lane, divided urban arterial roadway. Other new housing developments are planned for the area south of the project site. Nighttime ambient levels for the more

developed suburban area that the project area is becoming would be expected to be closer to 45 dBA.

In addition, nighttime operation of SVEP, while it may occur, will be relatively rare. As a peaking power facility, the project's annual capacity factor will range between 20 to 40 percent, and the most common times of operation will be times of high electrical demand, such as summer afternoons, although the project could provide power when needed during outages at night under emergency outage circumstances, which would be rare.

Potential noise control measures that may be incorporated into the project design include:

- Increasing combustion turbine air inlet and ventilation silencing
- Additional noise barriers around combustion turbine enclosure
- Increasing stack silencing
- Increasing thickness of SCR plate steel
- Additional noise barriers around SCR inlet and expansion joint
- Low noise, slow speed cooling tower fan and motors
- Cooling tower noise barriers and/or splash noise attenuators
- Additional cooling tower noise barriers
- Silencers and/or enclosures on auxiliary equipment

#### 8.7.3.3.5 Tonal Noise

At the monitoring locations modeled here, no significant tones are anticipated. That is not to say that audible tones are impossible – certain sources within the plant such as the combustion turbine inlets, transformers, pump motors, cooling tower fan gearboxes, etc. have been known to sometimes produce significant tones. It is the applicant's intention to anticipate the potential for audible tones in the design and specification of the plant's equipment and take necessary steps to prevent sources from emitting tones that might be disturbing at the nearest receptors.

#### 8.7.3.3.6 Ground and Airborne Vibration

Combustion turbine generator facilities using the similar LM6000 machine have not resulted in ground or airborne vibration impacts and it is not anticipated that GE Energy's LMS100 technology would differ greatly in its ability to create ground or airborne vibrations. The proposed project is driven by gas turbines exhausting into a selective catalytic reduction (SCR) duct and a stack silencer. These very large ducts reduce low frequency noise, which is mainly the source of airborne induced vibration of structures.

The equipment that would be used in the proposed project is well balanced and is designed to produce low vibration levels throughout the life of the project. An imbalance could contribute to ground vibration levels in the vicinity of the equipment. However, vibration-monitoring systems installed in the equipment are designed to ensure that the equipment remains balanced. Should an imbalance occur, the event would be detected and the equipment would automatically shut down.

### 8.7.4 Cumulative Impacts

The project site is currently a rural and agricultural area that has been planned for industrial and residential suburban growth. Suburban infill is taking place at a rapid pace. The SVEP,

therefore, in conjunction with many other planned projects, will result in increases in project area ambient noise. The cumulative impacts of this noise will not be significant and adverse, however, because appropriate planning measures and mitigation measures are applied to new developments as they are to the SVEP. Included among new nearby projects are the Inland Empire Energy Center, a power plant located approximately 0.5 mile northwest, and the Menifee Valley Ranch specific plan development, including residential, community/open space, and commercial uses, to the east of the SVEP. Both of these projects have recently started construction.

### **8.7.5 Mitigation Measures**

SVEP proposes to implement the following measures.

#### **8.7.5.1 Noise Hot Line**

The Applicant shall establish a telephone number for use by the public to report any significant undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

#### **8.7.5.2 Noise Complaint Resolution**

Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all legitimate project related noise complaints.

The Applicant or authorized agent shall:

- Use the Noise Complaint Resolution Form typically suggested by CEC or functionally equivalent procedure to document and respond to each noise complaint.
- Attempt to contact the person(s) making the noise complaint within 24 hours.
- Conduct an investigation to attempt to determine the source of noise related to the complaint.
- If the noise complaint is legitimate, take all feasible measures to reduce the noise at its source.

#### **8.7.5.3 Construction Hours**

Noisy construction or demolition work (that which causes offsite annoyance as evidenced by the filing of a legitimate noise complaint) shall be restricted to 6 a.m. to 6 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

## 8.7.6 Laws, Ordinances, Regulations, and Standards

The following are the LORS that apply to noise generated by the project. They are summarized in Table 8.7-9.

TABLE 8.7-9  
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (Supplement A Section Explaining Conformance)
<b>Federal Offsite</b>		
USEPA	Guidelines for state and local governments.	Section 8.7.3.1.1.
<b>Federal Onsite</b>		
OSHA	Exposure of workers over 8-hour shift limited to 90 dBA.	Sections 8.7.3.1.2, 8.7.5.2.1 and 8.7.5.3.1. Also see Section 8.7, Worker Safety
<b>State Onsite</b>		
Cal/OSHA 8 CCR Article 105 Sections 095 et seq.	Exposure of workers over 8-hour shift limited to 90 dBA.	Sections 8.7.3.2.1, 8.7.5.2.1 and 8.7.5.3.1. Also see Section 8.7, Worker Safety
<b>State Offsite</b>		
California Vehicle Code, Sections 23130 and 23130.5	Regulates vehicle noise limits on California highways.	Delivery trucks and other vehicles will meet Code requirements. Section 8.7.3.2.2.
<b>Local</b>		
California Government Code, Section 65302	Requires local government to prepare plans that contain noise provisions.	Riverside County complies, Section 8.7.3.3.
Riverside County General Plan	The General Plan provides quantitative compatibility goals and policy.	Sections 8.7.3.3 and 8.7.5.3.4.
Riverside County Code, Chapter 15.04	Limits hours of construction within 1/4 mile of residence to 6 a.m. to 6 p.m.	Sections 8.7.3.3 and 8.7.5.3.4.

### 8.7.6.1 Federal

#### 8.7.6.1.1 USEPA

Guidelines are available from the USEPA (1974) to assist state and local government entities in development of state and local LORS for noise. Because there are local LORS that apply to this project, these guidelines are not applicable.

#### 8.7.6.1.2 OSHA

Onsite noise levels are regulated, in a sense, through the Occupational Safety and Health Act of 1970 (OSHA). The noise exposure level of workers is regulated at 90 dBA, over an 8-hour work shift to protect hearing (29 Code of Federal Regulations [CFR] 1910.95). Onsite noise levels will generally be in the 70- to 85-dBA range. Areas above 85 dBA will be posted as high noise level areas and hearing protection will be required. The power plant will

implement a hearing conservation program for applicable employees and maintain exposure levels below 90 dBA.

### **8.7.6.2 State of California**

#### **8.7.6.2.1 Cal-OSHA**

The California Department of Industrial Relations, Division of Occupational Safety and Health enforces California Occupational Safety and Health Administration (Cal-OSHA) regulations, which are the same as the federal OSHA regulations described previously. The regulations are contained in Title 8 of the California Code of Regulations (CCR), General Industrial Safety Orders, Article 105, Control of Noise Exposure, Sections 5095, et seq.

#### **8.7.6.2.2 California Vehicle Code**

Noise limits for highway vehicles are regulated under the California Vehicle Code, Sections 23130 and 23130.5. The limits are enforceable on the highways by the California Highway Patrol and the County Sheriff Offices.





#### **8.7.6.3 Local**

The California State Planning Law (California Government Code Section 65302) requires that all cities, counties, and entities (such as multi-city port authorities) prepare and adopt a General Plan to guide community development. The Noise Element of the Riverside County General Plan establishes land use compatibility guidelines depicted in Table 8.7-10. For low density and multifamily residential the maximum normally acceptable level is 60 dBA and 65 dBA, respectively (CNEL/ $L_{dn}$ ). The exterior noise standard adopted in the Menifee Valley Ranch Specific Plan EIR (Riverside County, 2002) is 65 dBA CNEL.

In addition to the land use compatibility guidelines, the Noise Element establishes Policy N2.3 which states “Mitigate exterior and interior noises to the levels listed in [Table 8.7-11] to the extent feasible, for stationary sources.” The County guidance also states: “These are only preferred standards; final decision will be made by the Riverside County Planning Department of Office and Public Health.”

Chapter 15.04, Buildings and Construction: General Provisions, Administration and Enforcement, of the Riverside County Code restricts the hours of construction as follows: “Whenever a construction site is within one-quarter of a mile of an occupied residence or residences, no construction activities shall be undertaken between the hours of six p.m. and six a.m. during the months of June through September and between the hours of six p.m. and six a.m. during the months of October through May. Exceptions to these standards shall be allowed only with the written consent of the building official.”

TABLE 8.7-10  
Recommended Land Use Compatibility Guidelines

Land Use Category	Community Noise Exposure L <sub>dn</sub> or CNEL dB						Interpretation
	55	60	65	70	75	80	
Residential low-density single family, duplex, mobile homes							 <b>Normally Acceptable</b> Specific land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise requirements.
Residential multi-family							
Transient lodging—motels, hotels							 <b>Conditionally Acceptable</b> New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements has been made and needed noise insulation features have been included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Schools, libraries, churches, hospitals, nursing homes							
Auditoriums, concert halls, amphitheaters							 <b>Normally Unacceptable</b> New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made, and needed noise insulation features must be included in the design.
Sports arena, outdoor spectator sports							
Playgrounds, neighborhood parks							 <b>Clearly Unacceptable</b> New construction or development should generally not be undertaken.
Golf courses, riding stables, water recreation, cemeteries							
Office buildings, business commercial and professional							
Industrial, manufacturing utilities, agriculture							

Source: Riverside County, 2003.

TABLE 8.7-11  
Preferred Stationary Noise Limits

Land Use	Interior Standards	Exterior Standards
<b>Residential</b>		
10:00 p.m. to 7 a.m.	40 dBA (10-minute $L_{eq}$ )	45 dBA (10-minute $L_{eq}$ )
7:00 a.m. to 10 p.m.	55 dBA (10-minute $L_{eq}$ )	65 dBA (10-minute $L_{eq}$ )

### 8.7.7 Involved Agencies and Agency Contacts

Agency contacts relative to noise issues in the three jurisdictions within one mile of the project site are presented in Table 8.7-12.

TABLE 8.7-12  
Involved Agencies and Agency Contacts

Agency	Contact/Title	Telephone
County of Riverside Transportation and Land Management Agency		909-955-3200

### 8.7.8 Permits Required and Permit Schedule

No permits are required; therefore, there is no permit schedule.

### 8.7.9 References

- Barnes, J. D., L. N. Miller, and E. W. Wood. 1976. *Prediction of Noise from Power Plant Construction*. Bolt Beranek and Newman, Inc. Cambridge, MA. Prepared for the Empire State Electric Energy Research Corporation, Schenectady, NY.
- Beranek, L.L. 1998. *Noise and Vibration Control*. Institute of Noise Control Engineering. McGraw Hill.
- California Energy Commission (CEC). 2002. Final Staff Assessment. Potrero Power Plant Unit 7 Project. Noise. Testimony of Jim Buntin.
- California State Office of Noise Control. Guidelines for the Preparation and Content of Noise Elements of General Plans.
- International Organization for Standardization. 1996. *Acoustics – Sound Attenuation During Propagation Outdoors*. Part 2: General Method of Calculation ISO 9613-2. Geneva, Switzerland.
- Miller, Laymon N., et al. 1984. *Electric Power Plant Environmental Noise Guide*, 2nd Edition. Edison Electric Institute, NY.
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Riverside County. 2003. County of Riverside General Plan, Noise Element.

Riverside County. 2002. Menifee Valley Ranch Specific Plan and Environmental Impact Report. Specific Plan No. 301, Amendment No. 1, EIR No. 423. Riverside, California.

U.S. Environmental Protection Agency (USEPA). 1971. Noise from Construction Equipment and Operations, US Building Equipment, and Home Appliances. Prepared by Bolt, Beranek and Newman for USEPA Office of Noise Abatement and Control, Washington, D.C.